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SIGMA XI QUARTERLY

VOLUME I

SEPTEMBER, 1913

NUMBER 3



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EDITORIAL COMMITTEE:

James McKeen Cattell
Dayton Clarence Miller

Henry Baldwin Ward
Samuel Wendell Williston

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Let the idea be before you that this is not a simple fraternity but that we are taking the lead in forming an ideal of modern scholarship in which literary elegance and facility while important elements are not the prime factors but in their place intellectual discernment and judgment and powers for using means to ends are of prime importance. And to cultivate this spirit in an institution should be the noblest aim of a chapter. * * * I would be jealous of granting a chapter anywhere that I thought [this spirit] was lacking.

From Address of President Henry S. Williams, October, 1896.

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EDITORIAL COMMITTEE

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Address all communications to the Managing Editor, 5223 Madison Ave., Chicago, Ill.

QUALIFICATIONS FOR MEMBERSHIP

Attention is called to the communications in the present number of the Quarterly from Professors Prosser and Richtmeyer concerning the qualifications for membership in Sigma Xi. It has long been evident to those who have the welfare of the society at heart that the questions they propound are of vital importance; that, as Professor Richtmeyer says, "the most pressing need of the Society is some method of standardizing the criteria followed in the election of new members." The editors will gladly receive communications from those who have suggestions to offer; and they urge that the subject be considered in every chapter.

It is evident that an absolute standardization of the conditions of membership will be hard to attain; but it is also equally evident that a much more uniform standard than now prevails among the different chapters can be and should be enforced. The present writer has thought much on these subjects during the past ten years, and he would beg to offer the following as his understanding of the conditions imposed by the constitution:

First: What is included in a scientific investigation?

Originality, either in the observation of new facts or in the deduction of new principles from previously known ones. No investigation should be considered as qualifying the candidate for membership that would not be accepted and published by a reputable technical journal or learned society as a real contribution to knowledge. Furthermore, investigations should not be accepted as satisfying the conditions of the constitution, unless of extraordinary merit, when there is reason for believing that the candidate will do no more research work.

Second: What is meant by aptitude for scientific work?

Originality in the observation of new facts or in the deduction of new principles from previously known ones. The compilation of a text book, for instance, unless new methods are involved, does not make the writer an investigator. Such aptitude can only be satisfactorily determined by the actual performance of investigations sufficient to satisfy the proponents that the candidate not only can but will do such work.

Third: Does the "giving promise of marked ability" as applied to undergraduates require the completion of research work?

No; but it does mean more than the mere accumulation of knowledge. It means ability to use knowledge. It means originality, comprehension, application, and scholarship. However, if the amendments to the constitution, as proposed elsewhere in the present Quarterly, or some modification of them, concerning associate membership are adopted the chief danger that confronts the Society in the election of new members will be largely avoided. Diligent students with a strong love for science may then be admitted to probational membership with much good to themselves and to the Society.

Fourth: How many graduates may be elected by a chapter?

As many as show the necessary qualifications by the actual performance of meritorious research work. In general, all approved candidates for the doctorate in the university, under the limitations of the constitution, should be eligible for membership; and many of the approved candidates for the master degree also.

The writer fears that, in some chapters, the conditions of faculty and graduate membership have not always been rigorously enforced. No faculty member should be considered as a candidate who does not possess the research spirit, either in the actual prosecution of research work himself or in his ability to guide and inspire students to do such work. The doctor of philosophy who has terminated his research work with his graduating thesis should, ordinarily, not be considered as eligible. Alumni membership is in a sense honorary membership, and especial care should be taken in its bestowal.

S. W. W.

An examination of the conditions which prevail in different Chapters shows that at the present date there is a rather wide divergence of opinion regarding the basis for election to membership in Sigma Xi. Some cases among recent elections are so conspicuous, that one is tempted to ask whether members are actually

familiar with the requirements of the Constitution. There are only three distinct grades of membership: faculty, graduate, and undergraduate; since both non-resident and alumni members are elected on the standards prescribed for faculty elections.

The terms under which faculty members are elected are briefly stated by the Constitution as "noteworthy achievement as an original investigator". The conditions under which a graduate may be chosen are that such a student has "by actual work exhibited an aptitude for scientific investigation." Of undergraduates, it is specified that one is eligible who "has given promise of marked ability."

Certainly no man can reasonably qualify under the limitations for faculty members who has not actually published research, and such as is more than preliminary or trivial in character. Clearly, no graduate can meet the terms of the Constitution who has not completed something specific which gives an actual concrete demonstration of his aptitude for scientific investigation. In both of these cases, the qualifications of the candidates can be established before any committee or outside individual by an exhibit of the basis on which the election is made. But the evidence offered in support of some faculty elections contains nothing that is in any sense "noteworthy" and of many graduate students it is frankly acknowledged that they have not yet finished their work but "are going to do something good". Is not the latter in fact the fulfilment of an undergraduate standard, and have we not actually reduced the limits set by our Constitution by one grade so as to elect faculty members in such cases on a graduate basis and the latter class on an undergraduate standard?

Succinctly stated, the faculty qualification calls for published research, the graduate qualification for completed research, and the undergraduate test for promise of research. An apparent exception may be found among those students of applied science whose achievement has assumed a concrete form, such as planning a great bridge, laying out an engineering plant, or producing a new type in the breeding of plants or animals, which would equally exhibit ability as an investigator, even though it be not published research in the narrow sense of the word.

Most chapters have found a marked difficulty in determining what constitutes for an undergraduate "promise of research." If a thesis is required from senior students, as is the case in many engineering and some other scientific courses, then it is not difficult to test the ability of the student as an independent worker, even

though he may be merely repeating the work of an earlier investigator. Furthermore, where the student has covered advanced courses, which demand some power to think, to assimilate results, and to present them after thorough mental transformation, then also the student can be tested as to originality and power. But certainly no elementary course gives any opportunity for trying out a student in any such fashion, and so far as the average collection of courses in the ordinary undergraduate's record is concerned, it presents nothing that tests the research promise of the individual. Few chapters conduct the rigid examination into the record of the individual student which is the habit of the Alpha Chapter. That record does not depend upon percentage results of a marking system (see *Quarter Century History*, page 23) but upon critical examination of the academic history of each individual student. Without such scrutiny any effort to select undergraduates on the basis of "promise of research" is clearly futile. H. B. W.

TO CHAPTER SECRETARIES

The editors have been much encouraged by the letters of approval they have received. In common with many others, they believe that the *Quarterly* can be made of much service in the attainment of the ideals of Sigma Xi. But, they must again remind its readers, in all earnestness, that its success depends upon the chapters. To those who have contributed articles, news items, and reports, the editors give their sincere thanks. But they feel somewhat discouraged in the results of the numerous appeals made to the chapter secretaries. At least three personal letters have been written to each secretary asking for chapter reports, but, so far, in the majority of cases, without result. Twelve chapters only have sent in acceptable reports. The editors are well aware that in some cases it is difficult for the secretaries to comply with the requests for all the information concerning new members, etc., under the somewhat indefinite methods which have prevailed in the past. Reports from sixteen chapters are urgently desired for the next number of the *Quarterly*, which it is hoped may be published in December, before the time of the next Convention.

THE IDEALS AND STANDARDS OF SIGMA XI

BY CHARLES S. PROSSER

It happened that during the years of the inception of Sigma Xi the writer was closely associated with Professor Henry S. Williams of Cornell University as a graduate student and instructor in his department and was often favored with his views concerning the need of an honor scientific society, to which students of marked scientific ability for research might be elected. A brief statement of Professor Williams' connection with the organizations at Cornell that finally merged into Sigma Xi is important in a consideration of its ideals. The writer does not remember the exact date when this topic was first mentioned to him by Professor Williams, but would say that it was probably some time in 1883. From time to time he spoke of his efforts to interest other Cornell professors in natural history in such an organization; but the senior professor was so opposed to any organization using Greek letters for its name that Professor Williams received little encouragement. Finally, in the spring of 1886, he decided to organize an honorary geological society composed of students that had studied at Cornell and given promise of marked research ability in this science. This organization was called The Society of Cornell University Geologists, and during commencement week of June, 1886, those that had been selected for membership, who were in Ithaca, were asked to meet in the Geological Laboratory, where a short speech was made by Professor Williams. After this speech each member was presented with a small geological hammer on one side of which his initials and date of graduation had been stamped, and on the other side S. C. U. G. (the initials of the society). This was accompanied by a letter stating that: "In recognition of the excellence of your scientific scholarship attained while under instruction in Cornell University, I take pleasure in presenting you with the badge of membership of the Society of Cornell University Geologists—(a geological hammer appropriately stamped with S. C. U. G. and date of graduation).

May it ever be used in truthfully interpreting the laws of nature, to the honor of your Alma Mater and the good of mankind.

Henry S. Williams,

Teacher in Cornell University,

June 17, 1886."

The hammers were given to the following Cornell graduates, according to a list furnished by Professor Williams, who thus became members of this society: F. W. Simonds, '75; J. A. Holmes and F. C. Curtice, '81; J. C. Branner, '82; E. H. Preswick and C. S. Prosser, '83; C. D. [David] White, A. L. Coville and R. T. Hill, '86.

This society, however, was not of broad enough scope to satisfy Professor Williams and he drew up a preamble for a national scientific organization, one paragraph of which is of especial importance in this connection. It reads as follows: "Therefore we believe it is highly desirable to encourage high attainments among the future students of Cornell University and other kindred institutions by recognizing by some mark of honor those who exhibit special ability in investigating, understanding and interpreting the facts of nature in the various branches of modern science

This society shall be known as the Society of Modern Scientists or by the letters *O. D. P.*, *observare—discrete—intellege at patefice.*"

In a letter to the writer, dated December 31, 1903, Professor Williams stated that this preamble: "I seem to have written out before I knew anything about Sigma Xi, and the foundation elements of research; i. e., observation, discernment and exposition or interpretation, signified by the Latin words *observare*, *intellege* (or *discrete*, which is put above it as having been my second thought) and *patefice*, I think will stand examination as indicating the most important directions which modern development of education is taking."

The story of the beginning of an independent movement for the formation of an honorary scientific society at Cornell by William A. Day and Frank Van Vleck shortly before the 1886 Commencement, and the organization of the Society of the Sigma Xi the following fall with a membership of nine engineers, has been told in several publications. Professor Williams learned of this movement when he attempted to get the Engineering Department to join hands and select men in the same way from those departments that he was advocating for the departments of pure science. He found that the formal organization of Sigma Xi had gone further, which led to his adopting that as a working nucleus and suggesting to the engineers that it be made a University society. This proposal was favorably received and he dropped his own movement for a

Society of Modern Scientists. The minutes of the second meeting of Sigma Xi state that the proposals of Professor Williams were accepted, and at the fourth meeting he was nominated for a member of the Society and unanimously elected. It was obvious to the early members of the Cornell chapter that Professor Williams became the leader of the movement, and in May, 1887, he was elected its first President. At the following Commencement he delivered an address entitled "The Ideal Modern Scholarship" at the inauguration of the Alpha Chapter at Cornell University, on June 15, 1887. In this address it was stated as the third essential for the "ideal modern scholar that he must be a specialist, which means that he must take his place among the workers of the world, and fill that place. In his specialty he must think for himself, plan for himself, act for himself. Here he must rest on no one, but be himself a support of others."¹

The importance of research in the qualification for membership in Sigma Xi was emphasized by Professor Williams in his report on behalf of the Committee on Extension at the second convention of the Society in Springfield, Massachusetts, in August, 1895, when he said that:

"It proposed to recognize and elect to its membership those men in our institutions of learning who should exhibit in a marked degree the qualifications of natural endowment and training required for successfully conducting original research in the various branches of science.

"Thus *original research* bears the same relation to Sigma Xi, as literary scholarship does to Phi Beta Kappa; and it is believed that the cause of original research, and that part of the higher education which trains the qualities required in scientific pursuits, will be benefitted by honoring with election to Sigma Xi those men who during their college course show marked proficiency in these directions."

The importance of Professor Williams' counsel and influence in the organization of Sigma Xi was unquestionably very great, as is indicated in the preceding part of this article. It is sometimes said that Sigma Xi was founded by a group of engineers who did not attach any great weight to the ability to carry on original research. This perhaps might have been true if Professor Williams had not become an active member of the group of founders, at so early a date and impressed upon them the importance of founding a national honorary scientific society with broad ideals, in which

¹The Ideal Modern Scholarship, Ithaca, 1887, p. 8.

the ability to conduct independent research, or the promise of such ability in undergraduates, should be regarded as the first and most important qualification for membership. The honor of its membership was intended for those scientific students who were striving to increase the sum of human knowledge; and not particularly for those who planned to become wealthy by means of applied science in the business world, for those who wished to lead lives of ease, or, finally, for those who wished to shine in the social world. How foreign these things were to the aims of the Alpha Chapter of Sigma Xi was ably expressed by Dr. E. B. Titchener in his presidential address to the Cornell Chapter in June, 1900; an address which ought to have large circulation among the various chapters of this Society. Among other things Professor Titchener said:

"I pass to the third portion of my address: to a characterization of the life which we, as votaries of science, may hope or must expect to lead in the modern state. And it seems to me that there is a kind of balance-sheet to be struck; that there are certain definite gains, and certain definite sacrifices in the scientific life; and that it will be of profit for us to face the issues squarely, lest we find ourselves undeceived when it is too late to turn back.

"In the first place, the scientific man takes the vow of honorable poverty. We may, of course, have extraneous sources of income. But there is no money in science

"There is, indeed, a great gulf fixed between the world of business, with its self-seeking and bargaining, and the world of science, with its self-renunciation and mutual confidence. The difference will force itself upon you in all sorts of unexpected ways.

"There is a second vow that the scientific life demands: the vow of hard work. Science is an exacting task mistress; and those who follow her must 'shun delights and live laborious days'. Nor is this a light matter. Man is by nature a lazy animal. The power of sustained work comes late in the history of the individual, as it comes late in the history of the race; and the love of sustained work comes later still. And all scientific work is sustained work. No one knows, but the scientific man himself, all the wasted labor and irrational thinking and sheer loss of time involved in the very smallest addition to the sum of knowledge

"There is lastly a third vow to be taken: the vow of isolation. The life of the man of science must be a lonely life. It is not only that we have, most of us, to do our scientific work, as Helmholtz said, in our spare time, so that we have little leisure for the amenities of the social life around us. That is something, truly;

but there is more than that. If we are to carry science beyond her present bounds, in any field of work, we must specialise. And that means that we shall hardly find, away from university centers, even one or two of our acquaintances who are in intelligent sympathy with us; we must work alone. Even within a university, the number of men who thoroughly understand and appreciate their neighbor's work must be small."

In the writer's mind there has never been any question but that membership in Sigma Xi was intended primarily for those professors, instructors and graduate students conducting original scientific investigation, and those undergraduates giving promise of such ability. Or, as Professor Titchner so well expressed it in the above mentioned address to the members-elect of Sigma Xi:

"Some of you are taken from the instructing staff of the University. You, Instructors, we welcome as proved men, tried servants of science, our common mistress. Many of you are drawn from the ranks of the graduate students. You, Graduates, we welcome, because you have paused now, at the outset of your career, to do something for the furtherance of human knowledge; and,—what I think is more important even than that,—because you have paused to prepare yourselves to carry the message of science into all those various spheres of activity to which you shall presently be called. Many of you, again, are undergraduates. You, Undergraduates, we welcome,—not because you have done good work in your courses; anybody can do good work in his courses,—but because we think we discern in you some promise of ability to perform scientific work, and some promise of good will to realize that ability. Weigh that well, you who are to form the youngest generation of this Society of the Sigma Xi; do not think lightly of it, or of the men whose opinion it now is."

The writer was asked to say something in this article concerning the "Uniformity of Standards." An active membership of several years duration in three different chapters of Sigma Xi has taught him that up to the present time, at least, there is a good deal of difference in the standards of the various chapters. His ideals were naturally those of the Alpha Chapter, and sometimes it has appeared as though some of the other chapters had not caught the real meaning of Sigma Xi. This condition, however, was the natural result of the method under which some of the chapters were organized. The charter membership included all those professors that taught scientific subjects, or in some instances even professors that taught non-scientific subjects to scientific students.

Naturally, part of these professors were not engaged in original investigation and had no particular sympathy with or comprehension of it. Their criterion for the election of a student was almost invariably that of high marks. This standard not infrequently led to controversy when the name of a student with lower marks, but better promise of original research, was proposed for election. In some instances the discussions have been strenuous, as in one meeting when the Professor of English in one institution made a speech deploring the effort to lower the standard of Sigma Xi, as he expressed it, when the name of the senior who gave the most promise of ability to conduct scientific research was proposed; but the average of whose marks for the four years of his course was lower than that of some other students. In the chapters, however, which have come under the writer's observation it is his opinion that the number of those who believe in this standard for Sigma Xi has decreased, as well as their influence.

There is still considerable difference of opinion as to what constitutes "promise of marked ability in those lines of work which it is the object of this Society to promote," as stated in the Constitution, when it comes to the election of undergraduates. The difference of view is probably most marked between the professors in the departments of pure science and those of the technical or applied sciences. It happens that the students of the former group of professors have usually made some minor investigation and not infrequently published something concerning it; while such evidence of research is less frequent among the students of the second group of professors. The difficulty which arises at election is that apparently the professors of the second group base their nominations more generally upon the standing of the student as indicated by his marks in the Registrar's office, while the students of the other class have done something that gives promise of ability to carry on scientific research. It has been suggested that in the engineering colleges those students with a high class standing might be elected members of Tau Beta Pi, the honorary engineering society, or Eta Kappa Nu, the honorary electrical engineering society, and there are doubtless other honorary societies for technical students; while the smaller number who had actually done something in the line of original research might be elected to Sigma Xi. Naturally, some students would be elected to Sigma Xi and at least one of the other honorary technical societies, the same as at present, some students are elected to both Phi Beta Kappa and Sigma Xi. This question is one that arises principally in those chapters where under-

graduates are elected and probably is relatively unimportant in those where only graduates and members of the teaching staff are elected to membership. It is the writer's belief that the publication in the Sigma Xi Quarterly of the chapter reports giving lists of the new members, together with the title of their original work, will do much toward making the standards of election more uniform. In fact, it appears to him that the appearance of this periodical marks an epoch in the uplift of the standards for the whole society of Sigma Xi.

Ohio State University.

THE ELECTION OF NEW MEMBERS

BY F. K. RICHTMEYER

If one may judge from the brief reports already presented, one of the most pressing needs of the society is some method of standardizing the criteria followed in the selection of new members. At the present time, not only is there great diversity of practice among the several chapters, but, judging from our own chapter (Cornell) different departments in the same chapter differ as to the necessary qualifications of the candidate. * In spite of careful consideration given to the subject during the past six or eight years by various special committees of our chapter, we are still as far as ever from a satisfactory interpretation of (c) and (d) of Art. III, Sec. 4, of the constitution, regarding the qualifications for resident graduates and undergraduates.

For example: What is included in "Scientific investigation?" Does "A Study of the Market Conditions of [Some Commodity]" when done by a student of a technical college, whose students are eligible to membership, differ materially from the same thesis when done by a student in the department of Economics, students from which are not eligible to membership?

Does a candidate show "aptitude for scientific investigation" by reworking data which has been compiled from other sources, but which he himself has had no part in obtaining?

Does "actual work" mean the *completion* of some thesis or

*"Candidate" is here used as "one who is being considered by the chapter for membership"; not, of course, as "one who has applied for membership."

problem, or has the candidate shown the necessary ability when he has his investigation well under way?

Does the "giving of promise of marked ability", as applied to undergraduates, require the completion of research work?

Art. IV, Sec. 5, limits the number of *undergraduates* to be elected during any one year to "one fifth of the senior class in scientific and technical courses"? How many Graduate students may be or are elected by the several chapters?

When a senior is elected at the end of his course, and leaves college to engage in so-called practical work, after having attended perhaps one meeting of his chapter, what means exist, at present, for keeping up his interest in the society?

These questions and others of a similar nature cannot of course be answered directly by the Constitution of the Society. They concern rather the interpretation which each chapter, by its by-laws or otherwise, puts the Constitution as it now stands. It is this interpretation that should be made uniform. A Sigma Xi key from one chapter ought to stand for exactly the same honor as from any other chapter. To assist in securing such uniformity, if desirable, would it not be advisable for each chapter to record in the pages of this periodical its present practice in regard to a list of questions, covering the points concerned, to be prepared by the Editors or such committee as they may designate? Incidentally, such information would throw much light on the question of associate membership.

THE QUARTERLY

Many of us regard the establishment of the Quarterly as the greatest step in advance ever taken by the Society. In addition to keeping each active member in touch with the activities of other chapters and of the Society as a whole, opportunity is made, if utilized, of keeping alumni members interested in the Society. The Alpha Chapter has approximately one thousand alumni members scattered thruout the world. A few of these are active members of other chapters. A large number are engaged in such work that direct activity in the Society is absolutely impossible. Some of them have actually forgotten that they were ever elected to membership. And the fault lies entirely with us. We have made no effort to keep up their interest. Yet many of these alumni would be only too glad to assist in supporting the activities of the Society were they given a chance. What can the Quarterly do for them?

Ithaca, N. Y.

August 21, 1913.

THE POLICY OF SIGMA XI

BY JOHN M. COULTER

My own personal experience with Sigma Xi has been in connection with The University of Chicago, and the most effective policy in that university seems clear. Perhaps it is unscientific to conclude that the same policy would be most effective in all colleges and universities, and yet I have a conviction that this is true. Students are eligible to membership when they have given evidence of ability to investigate, the evidence being either the publication of research or an investigation in progress. As a consequence, the chapter is made up of men and women who are more than interested in science; they are actually working at it and have the point of view that belongs to investigators.

With such an audience, the meetings become real discussions of contributions to knowledge, presented by men who have been eminently successful, rather than popular lectures to interest undergraduates. The whole atmosphere of such meetings is one of scientific and stimulating companionship rather than that of a class room, where some one instructs and others try to recite that which is well known. To join such an organization is worthy of any one's ambition; for it has just the stimulating effect upon scientific endeavor that must have been in the minds of the founders of Sigma Xi.

A scientific society whose members are for the most part undergraduates, guided by the kindly interest of certain members of the faculty, is an organization that a man outgrows. It is a part of his youthful experience, like a college fraternity. He enjoys the memory of it, but it has outlived its usefulness for him. What is needed is an organization that is perennially attractive to scientific men, no matter how much they grow; and it must be evident that such an organization would appeal to the ambition of the undergraduate as no undergraduate organization could.

There is another aspect of undergraduate membership that is worth considering in this connection. The permanency of Sigma Xi as an effective organization must depend upon those who continue in the professional service of science. Undergraduates may include a

considerable number of those who are interested in science as a subject, but the number who continue in science as a profession is much smaller. What we need is an organization that will cull out from those who are interested in science those who are consecrated to science, and the result will be a real scientific society.

It is recognized that colleges and universities differ in the stress laid upon graduate work, but I cannot see why this should compromise the situation. In whatever institution a chapter of Sigma Xi is established, it should be a fellowship in the service of science, made up of workers rather than of guests waited upon by a few workers. To follow a policy of inequality in qualifications for membership would be suicidal, for there could be no real fellowship among chapters, and therefore no real national organization. There must be unity of purpose and equality of membership or disintegration will surely follow.



The Society was founded to "encourage original investigation in science." In its earlier years the Society seemed to fulfill its function by electing to membership those graduating students who had shown themselves apt in receiving instruction in our universities. Now, however, the Society can do more for the encouragement of research by giving recognition to those who have themselves engaged in the research function of the University and have contributed something to the advancement of knowledge. More important still than the recognition of research is the association of research workers for mutual encouragement and for the creation of more favorable conditions for research.

It is as fellow-workers in the search after truth and in the encouragement of research that we receive you into the Minnesota Chapter of Sigma Xi.

J. B. JOHNSTON.

From Initiation Address, June 1913

CHAPTER REPORTS

THE NORTHWESTERN CHAPTER

During the past year the Northwestern Chapter has held the following meetings with speakers and topics indicated:

October 23; Professor J. H. Long, The Physiological Significance of Certain Substances Used for the Preservation of Foods.

November 20; Professor Philip Fox, Investigation of the 18½ inch Objective of the Dearborn Observatory Telescope.

December 18; Professor U. S. Grant, Methods of Work in the U. S. Geological Survey.

January 15; Professor A. I. Kendall, The Relation of Bacterial Metabolism to the Production of Bacterial Toxins and Antitoxins.

February 20; Professor William Morris Davis, Cambridge, Mass., Human Responsees to Geographical Environment.

March 19; Professor G. R. Mansfield, Recent Work of the U. S. Geological Survey in Southeast Idaho.

April 23; Dean J. F. Hayford, Geodetic Surveys.

May 21; Mr. E. J. Moulton, The Theoretical Shape of the Earth.

The list of elections to membership follows:

Arthur I. Kendall, Ph.D., Dr.P.H., Professor of Bacteriology.

Publications: about 35 papers on bacteriology and related topics in various medical journals. Other papers now in press.

Alexander Alfred Day, M.D., Instructor in Bacteriology, Associated with Dr. Kendall in previous publications and current researches.

Albert Ferdinand Boretti, M.D., Instructor in Pathology. Recently accepted Chair of Pathology in Marquette University Medical School. Elected on basis of unpublished work in Northwestern University Medical School.

Herbert S. Philbrick, Professor of Mechanical Engineering Scientific Management, World of Today, Oct., 1911.

C. Herbert Jones, graduate student.

A problem in the Dynamics of Rotation. Thesis for M.A.

Siegel A. Buckborough, graduate student.

The Action of Hydrogen Peroxide upon Maltose. Thesis for Ph.D.

Ralph A. Crumb, graduate student.

The Electrical Conductance of Non-aqueous Solutions. Research in progress.

Thermal Conductivity of Concrete at Low Temperatures.

Fred L. Kerr, undergraduate member.

Proficiency and Promise in Mathematics.

Helen Skewes, undergraduate member.

Proficiency and Promise in Geology. Fellow in Geology, 1913-14.

The meetings of the chapter have been well attended and the year has been more than usually successful.

G. R. MANSFIELD,
Corresponding Secretary.

THE COLORADO CHAPTER

The University of Colorado chapter has held four meetings during the year, each meeting combining a business meeting and a scientific program. Ten scientific papers have been presented.

Our annual initiation of new members and initiation banquet was held this year on May 10. We were fortunate on this occasion in having with us a number of Sigma Xi members from Denver and from the Colorado Agricultural College at Fort Collins. The following new members were initiated into the chapter:

Dr. Robert Levy, faculty member.

Numerous papers in medical journals of U. S. A.

Lynn Ruliff Leonard, faculty member.

Electric Transmission Investigation. Thesis for M.A.

George Newton Rohwer, faculty member.

Contribution to Chemistry of Tungsten. To be published later.

Carl Mathias Duff, faculty member.

Thermal Conductivity of Concrete at Low Temperatures.

Thesis for M.A.

John Dudley Skinner, graduate (Yale, '95).

Improvements in Mining Machinery for Coal Mines.

Galister Herod Ashley, undergraduate.

Comparison of Ozone with Sulphur Dioxide as a Disinfectant.

To be published soon.

George Harmon Eveland, undergraduate.

Electric Transmission Investigation. Senior thesis.

Henry Alfred Doerner, undergraduate.

An attempt to Prepare a Soluble Phosphate from Phosphate Rock. Senior thesis.

James Robert Patrick Kettle, undergraduate.

Design of Stringers for Rail Road Bridges. Senior thesis.

Harry David McKinney, undergraduate.

Theory and Operation of Electrical Measuring Instruments.
Senior thesis.

Arthur Lathrup Sawyer, undergraduate.

Investigation of Road Materials. Senior thesis.

John Temple Hall, undergraduate.

Breakdown Tests on Insulating Materials. Senior thesis.

THE OHIO CHAPTER.

The particular kind of activity for the encouragement of research, other than simple existence itself, which has been under way in the Ohio Chapter for a number of years, has been the maintaining of a series of public lectures of high quality. The Ohio State University itself until this year has never made any official provision for general lectures of public or University interest. Our Chapter has therefore seized the opportunity of performing this function, and with such success that Sigma Xi has but to announce a lecture be the topic ever so specialized and a capacity audience is assured. Thanks to the good work of earlier officers of the Chapter this reputation has been extended into the city of Columbus itself as well as throughout University circles. This resulted in the J. C. Campbell Lecture Foundation which lasted up until year before last. For that year only the cost of the lectures was borne by an anonymous member of the local chapter. The problem, therefore, of the outgoing officers of the Chapter was the maintaining of the high standard of these lectures without exceeding the means of the Chapter. In this they believe they have been successful, thanks to the activity of the retiring President, Dean White. The usual series of four lectures was arranged as follows:

Professor C. E. Sherman, Head of the Department of Civil Engineering, Ohio State University and the Ohio Co-operative Topographic Survey.

Subject: The Ohio Canal System and Its Future.

Professor A. W. Gilbert, of Cornell University.

Subject: The Method and Scope of Genetics.

Professor Dayton C. Miller, Case School of Applied Science.

Subject: The Photographing and Analyzing of Sound Waves.

E. C. Schroeder, M. V. D. Pathologist, Bureau of Animal Industry,
U. S. Dept. of Agriculture.

Subject: The Relation of Animal to Human Tuberculosis.

The lecture by Professor Sherman was omitted because of his absence in the service of the state for a month at the time the lecture was scheduled. So this year the custom of having one of the lectures a local man was broken. The other lectures however were presented before the University under our auspices and in the case of Professor Gilbert's lecture jointly with the Ohio Plant Breeders' Association.

The seed sown, of thus presenting, in a formal manner to the student body and the instructional force, the results of investigations under way on the campus and by the foremost investigators from elsewhere, has borne fruit this year in the establishment by our College of Engineering under direction of Dean Edward Orton, Jr., is a series of public lectures of general engineering interest by men from outside as well as from the University staff. This was followed a little later by the adoption of the idea by the College of Arts for the broadening of the point of view of its students and now the University itself is starting a similar project especially for the benefit of the general public. Our Chapter, however, will not give up entirely, at least, the furnishing of a few high class scientific lectures until these new projects have become firmly established University customs.

The total active membership of the Chapter is ninety-four and of these four are on leave of absence from the University. Four meetings for the transaction of business were held during the past academic year:—the annual Fall meeting for election of members; two meetings in the early spring for the annual spring elections to membership, and the annual meeting in May for the election of new officers and the introduction of the newly elected members followed by a light collation at the Ohio Union.

It is rare that anyone is elected to membership at the Fall meeting, it being provided in the By-Laws that only members of the instructional force of at least one year's residence at the University and students of most unusual attainment shall be considered at that time. At the annual election in the spring both undergraduate and graduate students are voted upon.

Instructors are elected upon the basis of research accomplished and published, or engineering achievements, together with such implied assurance of continued interest in research as can be judged from actual productiveness in the immediate past. Graduate

students are elected upon the basis of the implied promise of future interest in research as far as that can be judged from progress in graduate studies and having actually shown ability in research in the prosecution of a graduate thesis or its equivalent. The gradual process of evolution which has arrived at the above ideals of election at Ohio State have not, however, operated long enough to make us a unit in the matter of undergraduate elections.

The ideals of our By-Laws are probably high enough for we take the Constitution of the Society rather literally and enforcement has in general been sufficiently rigid but interpretation by the individual University departments is not yet a matter of sufficient uniformity. Suggestions by the retiring officers of the Chapter toward a solution of this problem were presented at the annual meeting in April, but were unacted upon. It is evident however that the matter will not be allowed to rest as it is, for the incoming President has been responsible for much of the progress this Chapter made a number of years ago away from a too loose construction of eligibility ideals. Our undergraduates are elected upon the basis of promise of research ability and interest, as shown by their past scholastic record and the opinion of their nominators as to their promise.

The officers for the coming year will be found in the list (p. 84). The Chapter elected as Nominating Committee: The President, Vice President, Secretary, James R. Withrow, and D. J. Demorest.

The following list of persons was elected by the local chapter in the spring of 1912, and are included in this report to link up the list in the Quarter Century History with the elections of the present year:

Paddock, Professor Wendall, M. S., Faculty Member, Horticulture Department.

Numerous papers on horticultural topics.

McCall, Professor A. G., B. S. Faculty Member.

Various Publications on Soil Physics.

Ruth, Eugene, B. S. Graduate student in Agricultural Chemistry.

Composition of Sugar Beets During the Growing Season.

McAvoy, Blanche, B. A. Graduate student in Botany.

The Reduction Division in Fuchsia.

Conger, Allen C., B. A. Graduate Student in Zoology.

The Differentiation of the Lateral Lines in *Lepidosteus Osseus*.

UNDERGRADUATE STUDENTS

- | | |
|--|------------------------|
| Cameron, Hazel C. | College of Agriculture |
| Clevender, Clinton B. | College of Agriculture |
| Melchers, Leo | Horticulture |
| Phillips, Thomas G. | College of Agriculture |
| Taylor, Aaron E. | Forestry |
| Brain, Charles K. | Zoology |
| Chapman, A. K. | Physics |
| Fulton, Bentley B. | Zoology |
| Kostir, Wencel J. | Zoology |
| Nathanson, J. B. | Physics |
| Smith, A. W. | Physics |
| Clare, R. L. | Ceramic Engineering |
| Body for Inverted Mantle Rings. | |
| Potts, Amos P. | Ceramic Engineering |
| Construction of an Electric Furnace for Determination of Coefficient of Expansion. | |
| Gordon, C. S. | Electrical Engineering |
| Test of the Wagner Single Phase, Unity Power Factor Motor. | |
| Menke, O. H. | Electrical Engineering |
| The Small Single Phase Power Motor. | |
| Popp, C. M. | Electrical Engineering |
| Construction and Test of High Tension High Frequency Transformer and Condenser, | |
| Kromer, Edward | Civil Engineering |
| An Investigation of the Stresses in a Railroad Bridge. | |
| McCoy, E. W. | Civil Engineering |
| Same topic. | |
| Rosch, A. T. | Civil Engineering |
| Abolishing of Grade Crossings of the Norfolk and Western Railway in Columbus, Ohio. | |
| Knollman, E. P. | Civil Engineering |
| Same topic | |
| Lee Hugh B. | Mine Engineering |
| An Investigation of the Handling and Treatment of a Low Grade Gold Ore. | |
| The meeting of December 12, 1912, resulted in the election of William J. McCaughey, Ph. D., Assistant Professor of Mineralogy. | |
| The Solvent Effect of Ferric and Cupric Salt Solution Upon Gold. <i>Journal American Chemical Society</i> , vol. 31, p. 1261. | |
| Apatite and Spodiosite. With F. K. Cameron, <i>Journal Physical Chemistry</i> , 1911, p. 463. And many others. | |

The meeting of March 20, 1913, resulted in the election of the following:

W. E. Gatewood, B. A. Graduate Student in Bacteriology.

The Chemo-Therapy of Some Organic Salts of Copper.

R. L. Stehle, B. A. Graduate Student in Chemistry.

A Study of the Action Substituted Hydrazines Upon Benzo Quinones.

H. D. Holler, B. A. Graduate Student in Chemistry.

Electrolytic Copper Addition Agents.

S. W. Bilsing, B. A., B. S. Graduate Student in Zoology.

Quantitative Studies in the Food of Spiders.

Esther Faville, B. S. Graduate Student in Zoology.

Adaptions for Aquatic Life in Insects.

Osborne, Herbert, Jr., M. S. Graduate Student in Zoology.

The Hibernation of Insects.

The Hemipterous Genus, *Geocoris*.

UNDERGRADUATES

Latterner, S. W.

Architecture

Design of a Residence for the Governor of Ohio.

Salter, R. M.

Agricultural Chemistry

Salter, F. J.

Agricultural Chemistry

Richardson, Josephine

Agricultural Chemistry

Humphrey, Lillian E.

Botany

The Ohio Dogbanes. The Ohio Naturalist 13:78.

Gormley, Rose

Botany

The Ohio Violets. The Ohio Naturalist, 13:56

Ohio Rosaceae

Schory, V. S.

Ceramic Engineering

Matte Glazes Containing Boron.

Wilson, H.

Ceramic Engineering

Deformation Action of Feldspar-Kaolin Mixture.

Case, H. N.

Chemical Engineering

Electrolysis of Cyanide Solutions.

Johnson, Theo. S., B. S.

C. E.

Comparative Design of Circular and Rectangular Imhoff Tanks.

Logue, Glenn R.

C. E.

An Investigation of the Distribution of Loads Through a Reinforced Concrete Slab.

Spidel, R. H. H.

C. E.

An Investigation of the Distribution of Loads Through a Reinforced Concrete Slab.

Farmer, T. O.	E. E.
An investigation of Corona Loss on a Thousand Foot Span.	
Arndt, R. S.	E. E.
Same subject	
Kueckle, T. F.	E. E.
Design and Construction of Electric Action for Pipe Organs.	
Calland, J. W.	Forestry.
The Natural Reproduction of the Lodgepole Pine.	
Tonkin, Ellsworth	Mechanical Engineering
Tests of a Lubricant Testing Machine.	
Smith, E. C.	Metallurgy
Physical and Chemical Requirements of Brick for Blast Furnace Lining.	
Lake, W. W.	Pharmacy
An Investigation of Methods for the Examination of Medicinal Substances.	
Mary Storer	Zoology.
JAMES R. WITHROW, Secretary.	

THE CORNELL CHAPTER

It is the policy of the Chapter to invite the public to all lectures and demonstrations. Such public meetings are in charge of a standing committee, consisting of the president, *ex-officio*, and three elective members, whose duty it is to prepare a program for the year. The following list of lectures, given during the past year, will indicate the character of the chapter's activities in this direction.

December 16, 1912. Evolution and Heredity by Prof. Simon H. Gage, of Cornell University.

February 10, 1913. The Leading Characteristics of the Tides by Dr. R. A. Harris, of the Coast and Geodetic Survey.

February 24, 1913. Ferments and Enzymes, by Prof. Andrew Hunter of Cornell University.

March 31, 1913. The Effect of Impact on Bridges, by Prof. C. L. Crandall, of Cornell University.

April 14, 1913. The Miner and the Federal Government, by Dr. J. A. Holmes, Director of the U. S. Bureau of Mines.

May 5, 1913. Some Factors Which Determine Sex, by Dr. Oscar Riddle, of the Carnegie Institution.

May 10, 1913. Some Developments in Color Printing and in Color Photography, by Prof. G. S. Moler, of Cornell University.

May 17, 1913. The Automobile as a Result of Investigation and Research, by Prof. R. C. Carpenter, President of the Chapter.

May 31, 1913. Some Achievements of Modern Surgery, and Their Relation to the Pure Sciences, by Dr. M. B. Tinker, of Ithaca, N. Y.

The Chapter roll on April 1st, 1913, contained 155 active and 911 alumni members.

The following were elected to membership on May 10, 1913; each name is followed by the position held and last by the name of the department nominating.

MEMBERS OF THE FACULTY OF CORNELL UNIVERSITY (5)

Arthur J. Eames, B.A., D.Sc., Instructor in Botany, Botany.

James Nathan Frost, D.V.M., Instructor in Vet. Surgery, Dept. Surg. and Obstet., Vet. College.

Kenneth Bertrand Turner, C.E., M.C.E., Asst. Prof. Hydraulics, Civil Engineering.

Harry Porter Welde, Ph.B., Ph.D., Asst. Prof. of Psychology, Psychology.

Stephen Remington Wing, M.E., Instructor in Sibley, Sibley College.

GRADUATE STUDENTS (47)

Edward Riley Allen, B.S. Agr., Scholar in Chemistry, Chemistry.

Anders Knutson Angstrom, B.A., M.S., Fellow in Physics, Physics.

Jacob A. Badertscher, Ph.B., Ph.M., Instr. in Histol. and Embryol, Zoology and also by B. F. Kingsbury et al.

Elmer Eugene Barker, A.B., Assistant in Plant Breeding, Plant Breeding.

Forest Milo Blodget, B.S. in Agr., Fellow in Plant Pathology, Plant Pathology.

Edwin Garrigues Boring, M.E., A.M., Assistant in Psychology, Psychology and Physiology.

Jean Broadhurst, B.S., A.M. Path. & Bact. (Vet.), Physiol. (Med.)

Henry John Broderson, A.B., M.A., Assistant in Chemistry, Chemistry.

Charles Owen Brown, B.S., M.A., Assistant in Chemistry, Chemistry.

Oliver Elsworth Buckley, B.Sc., Instructor in Physics, Physics.

Karl M. Dallenbach, A.B., A.M., Psychology and Education.

Francis Murray Dawson, B.Sc. in C.E., Fellow in Civil Engineering, Civil Engineering.

John Randolph DuPriest, B.S. in E.E., Instructor in Sibley, Sibley College.

Ellsworth David Elston, A.B., Asst. in Physical Geography, Physical Geography.

Gail J. Fink, A.B., Asst. in Chemistry, Chemistry.

Jerome Arthur Fried, M.E., Instructor in Sibley, Sibley College.

Kasson Stanford Gibson, A.B. Asst. in Physics, Physics.

Charles Truman Gregory, B.S. in Agr., Instr. in Plant Pathology, Plant Pathology.

Lex Ray Hesler, A.B., Instr. in Plant Pathology, Plant Pathology.

Bascom Britt Higgins, B.S., M.S., Asst. in Botany, Botany.

Arthur Romaine Hitch, A.B., Asst. in Chemistry, Chemistry.

Charles William Honess, A.B., Scholar in Geology, Geology.

Joseph Stanley Hook, A.B., Instr. in Economic Geology, H. Ries, et. al.

Charles Wallace Hunt, M.E., Fellow in Sibley, Sibley College.

Thomas Barksdale Hutcheson, B.S., M.S., Plant Breeding.

Ivan Claude Jagger, B.S. in Agr., Fellow in Plant Pathology, Plant Pathology.

Robert Andrew Jehle, B.S.A., M.S.A., Fellow in Plant Path. until Oct., 1912, Plant Pathology.

Nathan Clarke Johnson, M.E., Fellow in Sibley, Sibley College.

Earle Hesse Kennard, B.A. (Pomona) B.A. (Oxford) Asst. in Physics, Physics.

Myron A. Lee, M.E., Instructor in Sibley, Sibley College.

Mary Burdick Lyon, B.A., Asst. in Biology, Entomology.

Alexander McTaggart, B.S.A., Plant Breeding.

Thomas Henry Addison Neelin, B.A., Physics.

Alice Ayr. Noyes, B.A., Scholar in Entomology, Entomology.

George Adin Osner, B.A., Fellow in Plant Pathology, Plant Pathology.

José Paez, C.E., Civil Engineering.

Ephraim Laurence Palmer, A.B., A.M., Asst. in Botany, Botany.

Emile Louise Platt, B.A., Physiology and Biochem.

William Howard Rankin, A.B., Instr. in Plant Pathology, Plant Pathology.

Herbert Byron Reynolds, Sibley College.

Fred Hoffman Rhodes, A.B., Asst. in Chemistry, Chemistry.

Frank Elmore Rice, A.B., Instr. in Agr. Chemistry, Chemistry.

Harold Eaton Riegger, A.B., Fellow in Chemistry, Chemistry.

Joseph Rosenbaum, B.S. in Agr. Asst. in Plant Pathology, Plant Pathology.

Christian Alban Ruckmich, A.B., A.M., Instructor in Psychol. Psychology and Education.

Constantine Demetry Sherbakoff, B.S. in Agr., Fellow in Plant Pathology, Plant Pathology.

Ransome Evarts Somers, A.B., A.M., Instr. in Economic Geology, Geology.

MEMBERS OF THE CLASS OF 1913 (11)

Charles Paul Alexander, B.S., Asst. in Farm Course, Entomology.

Ralph A. Bown, Physics.

Albert Francis Coutant, B.S., Asst. in Biology, Entomology.

Nathan Washington Daugherty, B.S. in C.E., Instructor in Civil Engineering. Civil Engineering.

Peter Andrew vander Meulen, B.Chem., Asst. in Chemistry, Chemistry.

John Merrill Olin, Chemistry.

Axel Olsson, Asst. in Paleontology, Geology.

Roger Williams Parkhurst, Civil Engineering.

Granville Akers Perkins, A.B., Chemistry.

CHAPTER REPORTS

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Walter McMillan Ralph, Asst. in Chemistry, Chemistry.

Henry Ten Hagen, Civil Engineering.

ALUMNI (3)

Henry Thomas Cory, B.M.E., B.C.E., M.C.E., (Cornell, '93), M.M.E., Cornell '96), Civil Engineering.

Lewis Radcliff, A.B. (Cornell, '05) Zoology.

Charles Everett Torrance, M.E. (1906), M.M.E. (1912) Sibley College.

WASHINGTON STATE CHAPTER

The University of Washington Chapter of Sigma Xi has held monthly meetings during the year. At these meetings an endeavor has been made to become acquainted with the research undertaken by the members, to ascertain the research conditions in institutions visited by members during leave of absence or during attendance at conventions, and finally to emphasize the necessity of a better correlation of the sciences if each is to advance as rapidly as possible.

The following have been elected to membership in the Chapter during the year:

Allen F. Carpenter, Faculty member.

Theorem for the Development of a Function as an Infinite Product. *American Journal of Math.*, Jan. 1913.

Bertha May Challis, Resident graduate.

Variations in *Thais Cemellose*. Thesis.

William James Chouinard, senior in Civil Engineering.

Seth Chapin Langdon, Resident graduate.

Relation between the Magnetic Field and the Passive State of Iron. *Jour. Amer. Chem. Soc.*, 35:759.

Effie Isabel Raitt, Faculty member.

Papers on Home Economics. *Home Economics Bulletin*.

Marion Radford, senior.

Edwin J. Saunders, Faculty member.

Climate of the Eastern Part of Puget Sound Basin. Soil survey reports of the Bureau of Soils, U. S. Dept. of Agriculture. Also other publications.

Melvin O. Sylliaasen, Senior.

Milton V. Veldee, Undergraduate.

The Value of *B. sporogenes* as an Indicator of Manural Pollution of Milk.

Irene West, Undergraduate.

Sanford M. Zeller, Resident graduate.

Fleshy wood-destroying Fungi of Western Washington. Thesis.

ROBERT E. ROSE Recording Secretary.

OPEN FORUM

A STUDY IN COMPARATIVE PSYCHOLOGY

The Secretary is a fairly busy man, he fondly hopes to do also some research and to justify his membership in Sigma Xi. Some years ago he offered to prepare a catalog and history for the Society. Like everything else, it has taken more time than expected and he is naturally anxious to close up the business. Many good people, including some of his warm friends, have neglected to pay up. The printers are dunning him and the debt is growing. He has had a clerk send out three notices to all, and again there is mailed a circular notice to *everyone alike*. He made it strong to arouse the dreamers, but even a dreamer should see that a printed notice can not be "personal." In the experiment antecedent conditions were identical. Note the results: Much money for the printer; some comments, but how they differ!

"With humble apologies."

"I never signed an order."

"I regret my forgetfulness."

"That was a good dunning letter."

"The mistake is due to poor business methods between you and your publishers."

"Your testy circular * * * is the very first notice * * * and since the chances are strongly against the miscarriage of all the alleged 'three notices', I suspect they were not sent."

"It takes a real letter, like the one you sent, to wake up some persons, myself included. I can not help confessing I liked your last circular tremendously."

"I feel resentful towards it [the letter] inasmuch as I positively have not received any notice."

"I plead guilty to part of your charges. Sometimes we get so busy and so full of one thing for a time that a directory of Heaven edited by Gabriel would not appeal to us without a few extra notices."

It is impossible to answer every letter. If you meet the critic, please help me explain. I assure you I will never do it again!

HENRY B. WARD.

NEWS ITEMS

The full list of Chapter officers printed on the last page of each issue will be a great convenience if chapter secretaries will keep it up to date.

A glance at the list of national officers facing page 84 will show that three chapters have failed to report the election of members of the Council to succeed those whose terms expired last January. Such an oversight is an unfortunate obstacle to the conduct of the business of the Society.

The Chapter at the University of Washington (Seattle) has issued a very attractive Year Book for 1913-14. It is a pamphlet of 20 pages, well printed, and bound in a durable cover. The contents include the Constitution, the chapter by-laws, lists of national and local officers, the full chapter roll, and a calendar for the academic year. The latter announces monthly meetings and two departments are designated to furnish the program for each of these meetings.

The Council has voted by a large majority in favor of holding the annual meeting at Atlanta in conjunction with the American Association for the Advancement of Science and President Cattell announces that it will presumably fall on December 30. He suggests further that it might be advisable for the delegates to lunch together and to hold the business session in the afternoon. This would be followed in the evening by the general dinner as has been the custom for several years. In spite of the distance, it is hoped to secure a good representation and it is time for each chapter to take under advisement the question of providing for the presence at Atlanta of at least one delegate from its membership. Full details of the meeting will be announced in the December number of the Quarterly, which will be mailed in time to reach members before the holiday recess.

CHAPTER OFFICERS
LIST FURNISHED BY THE CORRESPONDING SECRETARIES OF THE CHAPTERS.

CHAPTER	PRESIDENT	VICE-PRESIDENT	REC. SECRETARY	COR. SECRETARY	TREASURER
Cornell	Ernest Blaker.....	A. W. Gilbert.....	F. K. Richtmyer..	James McMahon..	W. A. Riley
Rensselaer	E. R. Cary.....	R. H. Carrington..	C. H. Andros.....	E. F. Chillman..	E. F. Chillman
Union	Olin H. Landreth...	Howard Opyke.....	Morland King.....	J. H. Cunningham	Chas. F. F. Garis
Kansas	P. F. Walker.....	H. P. Cady.....	U. G. Nitchell...	W. J. Baumgartner	H. M. Twenofel
Yale	Roswell P. Angier..	Wm. A. Drushel...	Harold S. Palmer..	Joseph W. Roe...	Wm. H. Dadourian
Minnesota	Edw. M. Freeman...	Alois F. Kovarik..	Francis G. Frary..	Fredk. K. Butters	Wm. H. Hunter..
Nebraska	H. H. Waite	Geo. Borrowsman..	V. L. Hollister...	A. L. Candy.....	L. B. Tuckerman, jr
Ohio	Chas. S. Prosser...	John F. Lyman.....	W. M. Barrows...	I. R. Withrow.....	J. A. Wilkinson..
Pennsylvania	Allen J. Smith ..	J. M. Macfarlane..	Maurice J. Babb..	J. W. Harshberger	J. P. Moore
Brown	Ansel Brooks.....	Charles W. Brown..	R. G. D. Richardson	T. M. Pletteplace.	Philip H. Mitchell.
Iowa	Geo. W. Stewart...	Henry J. Prentiss..	Fay C. Brown.....	G. L. Houser.....	Robert B. Wylie
Stanford	Robert E. Swain...	W. K. Fisher.....	Leroy Abrams.....	LeRoy Abrams...	LeRoy Abrams
California	Frederick Slate...	A. S. Eakle	Elmer E. Hall....	Edmond O'Neill..	J. N. LeConte
Columbia	George F. Sever...	Arthur L. Walker..	H. E. Hawkes....	Chas. P. Berkeley	H. E. Hawkes
Chicago	John M. Coulter...	A. P. Matthews...	H. I. Schlesinger	J. Stieglitz.....	H. I. Schlesinger
Michigan	Wm. C. Hoad.....	Ermine C. Case...	Walter F. Hunt...	Walter F. Hunt...	Geo. R. LaRue
Illinois	G. A. Miller.....	H. W. Mumford...	Edward Barrow...	C. G. Derrick.....	T. E. Savage
Case	T. M. Focke.....	F. R. Van Horn...	W. J. Sweetser...	W. J. Sweetser...	C. D. Hodgman
Indiana	Aug. G. Pohlman...	M. E. Haggerty...	Mrs. F. N. Andrews	Cora B. Hennel...	John B. Dutcher
Missouri	Herman Schlundt..	W. C. Curtis.....	A. Lincoln Hyde...	E. J. Durant.....	Chas. W. Greene
Colorado	A. R. Peebles.....	R. D. George.....	P. G. Worcester...	P. G. Worcester...	Ira M. DeLong
Northwestern	John H. Long.....	Olin H. Basquin...	Robt. E. Wilson...	Geo. R. Mansfield	Robt. E. Tammall
Syracuse	Chas. W. Hargitt...	E. H. Archibald...	Chas. G. Rogers...	Chas. G. Rogers...	F. F. Decker
Wisconsin	L. R. Ingersoll...	Eliot Blackwelder..	Walter J. Meek...	Eric R. Miller...	Oliver P. Watts...
Washington State..	Chas. F. Burgess...	John Weinzierl...	Robert E. Rose...	H. C. Stevens...	Geo. S. Wilson
Worcester	Joseph O. Phelon...	Frederic Bonnet...	John H. Nelson...	Howard C. Ives...	Albert W. Hull..
Purdue	Stanley Coulter...	W. E. Stone.....	C. G. Woodbury...	R. L. Sackett.....	R. G. Dakes
Washington Univ.	Francis E. Nipher..	William Trelease...	W. E. McCourt...	Ernest L. Ohle...	J. F. Abbott

Including Chapter Reports received up to October 1, 1913

COUNCIL OF THE SOCIETY OF THE SIGMA XI

PRESENT OFFICERS

J. McKEEN CATTELL, President	Columbia University, New York City
JOHN H. LONG, Vice-President	Northwestern University, Evanston, Illinois
DAYTON C. MILLER, Recording Secretary	Case School of Applied Science, Cleve- land, Ohio
HENRY B. WARD, Corresponding Secretary	University of Illinois, Urbana, Illinois
J. F. KEMP, Treasurer	Columbia University, New York City

PAST PRESIDENTS

HENRY S. WILLIAMS (1895-1901)	Cornell University, Ithaca, New York
S. W. WILLISTON (1901-1904)	Chicago University, Chicago, Illinois
E. L. NICHOLS (1904-1909)	Cornell University, Ithaca, New York
F. O. MARVIN (1909-1910)	University of Kansas, Lawrence, Kans.
H. T. EDDY (1910-1912)	University of Minnesota, Minneapolis, Minn.

CHAPTER REPRESENTATIVES

TERM ENDING JANUARY 2, 1913*

Rensselaer—C. W. CROCKETT	Washington University—F. E. NIPHER
Stanford—H. J. RYAN	

TERM ENDING JANUARY, 1914

Case—C. S. HOWE	Nebraska—E. W. DAVIS
Chicago—JULIUS STIEGLITZ	Northwestern—WM. A. LOCY
Iowa—THOS. H. MCBRIDE	Ohio—EDWARD ORTON, JR.
Kansas—E. H. S. BAILEY	Worcester—A. W. ELWELL
Minnesota—H. T. EDDY	

TERM ENDING JANUARY, 1915

Columbia—C. C. CURTIS	Syracuse—W. H. METZLER
Cornell—H. S. WILLIAMS	Union—OLIN H. LANDRETH
Indiana—C. H. EIGENMANN	Washington State—HENRY LANDES
Missouri—O. M. STEWART	Yale—JOHN C. TRACY
Pennsylvania—E. F. SMITH	

TERM ENDING JANUARY, 1916

Brown—ALBERT DE FOREST PALMER	Michigan—KARL E. GUTHE
California—J. C. MERRIAM	Purdue—C. H. BENJAMIN
Colorado—FRANCIS RAMALEY	Wisconsin—JAMES B. OVERTON
Illinois—S. A. FORBES	

Chairman of the Council.....JULIUS STIEGLITZ (Chicago)

According to the Constitution the terms of all national officers end with the annual convention which comes at the close of the period for which they were elected. Nevertheless officers all serve until their successors are elected.

*The election of their successors has not been reported to date.

OFFICIAL ANNOUNCEMENTS

A few extra copies are still to be had of the

QUARTER CENTURY RECORD AND HISTORY

A copy will be sent prepaid on receipt of \$2.50. The Secretary is not authorized to vary these instructions given by the General Convention.

PRINTED BLANKS

The General Convention has instructed the Secretary to keep for chapters a supply of printed blanks as enumerated below. According to instructions these are to be forwarded to chapters under the following stipulations:

Membership Certificates, stamped with the great seal of the Society. In packages of fifty prepaid, on advance of payment of \$2.50 for each package.

Index Cards, on the condition that a duplicate set be sent for the general index of the Society maintained in the secretary's office. Gratis on demand.

Report Blanks, for submitting annual reports giving chapter officers, elections, and other statistical data. Gratis on demand.

SIGMA XI PUBLICATIONS

It has been proposed to bind up a number of sets of important early documents regarding Sigma Xi and to place a set in each of a selected series of the leading libraries of this country.

The undersigned will be glad to receive copies of such publications relating to the Society in general or to any one of its chapters which those interested may be able and willing to furnish for this purpose.

HENRY B. WARD.